



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
215 Fremont Street
San Francisco, Ca. 94105

RECEIVED
APR 20 1987

MAR 10 1987
DIVISION OF OIL & GAS
SAN FRANCISCO

MEMORANDUM

Subject: Technical review of aquifer exemption request by Berry Petroleum Company (Berry Ventures) for the Olcese Formation in the Poso Creek Oil Field, Kern County, California.

From: David P. Kyllonen, Hydrogeologist *David P. Kyllonen*
Policy, Standards and Technology Section W-6-3

To: Janet Hashimoto
Underground Injection Control Section W-6-2

Through: Bob Wills, Chief
Policy, Standards and Technology Section

In addition to my comments regarding the aquifer exemption request by Berry Petroleum Company (successor to Berry Ventures) I have included an attachment with comments to send to the Applicant regarding deficiencies in the aquifer exemption request. The attachment follows the general format of the draft aquifer exemption criteria check list and complements my comments below. Some comments may not appear both below and in the attachment.

It is stated by the Applicant that because the Santa Margarita Formation has been used successfully and has caused no damage by vertical or lateral migration to waters of better quality and because the Olcese Formation is deeper it should be an adequate disposal zone and, therefore, should be exempted. This argument supplies no supporting evidence that the injected water will be contained within the confines of the Olcese Formation.

The Applicant states that the area being requested for exemption is not within the boundaries of any water district in Kern County. I find this hard to believe considering the value of water in the State of California. I would like to see a map depicting the boundaries of the water districts for this portion of Kern County.

I agree with the Central Valley Regional Water Quality Control Board's comment regarding the faults in the area. A memorandum from the Board to CDOG was included by CDOG in their recommendation to EPA. More information is needed on the faults to determine if they will act as barriers to ground-water flow. If the faults are barriers to flow this disposal zone has a finite amount of storage available. It may not serve as a disposal zone very long before the same problem occurs as has happened apparently with the current disposal zone, the Santa Margarita Formation.

The CDOG Public Notice implies that the proposed exempted area is only that portion of the Olcese Formation in the Poso Creek Oil Field located within section 29, T 27 S, R 27 E. The Applicant stated that the "areal extent" being requested for exemption is approximately one square mile. The Poso Creek Oil Field Index Map supplied by the Applicant indicates this one square mile to be in portions of sections 28 and 29, T 27S, R 27E. Which square mile is being requested for exemption? To add further confusion Berry Petroleum Company responded to the Regional Board's comments and one of the comments to the Regional Board stated that only section 29, T 27S, R 27E was being requested for exemption.

Structural Cross-Section B-B' has no horizontal scale. This makes it difficult to determine how far the faults are away from the proposed exempted area and the proposed disposal well.

The Index Map for Structural Cross-Section B-B' appears to mark the wrong well as being the proposed injection well.

The Olcese Formation in the Poso Creek Oil Field does not meet the test for being a hydrocarbon producing zone. The Applicant states this up front, therefore other requirements for exemption must be met as per 40 CFR 146.4.

In Berry Petroleum Company's letter to David Clark, CDOG, it is stated that analyses were submitted of the Olcese Formation water and the produced water. Only the analysis of the Olcese Formation water was submitted to EPA. The analysis of the produced water needs to be submitted to EPA.

The Poso Creek Fault is not identified on Structural Cross-Section B-B' as stated by the Applicant, nor is it shown on any map. In fact, none of the faults are shown on a map. Another important omission by the Applicant is the fact that the proposed exempted zone, the Olcese Formation, is not shown on a cross-section.

The Applicant and the CDOG emphasize several times each that the Olcese Formation waters will be "upgraded" because the disposal water has a lower TDS. But, what about down the road? Some other operator may have considerably higher TDS fluids and thus "degrade" the Olcese Formation waters. The Regional Board stated their concern about their policy of non-degradation of the State's waters. If the proposed exemption is approved maybe we should consider stipulating that waters of not greater than 10,000 mg/l TDS shall be injected into this well or any other wells in the future within the Poso Creek Oil Field. Better yet, stipulate that the injectate will not have a higher TDS value than the formation water. This could be applied to other exemption requests in the future too, of course.

Berry Petroleum Company states in their letter of March 19, 1986, to David Clark of CDOG the following: "The above geological description and attached cross-sections, we believe, clearly demonstrates that water movement will be from west to east. Furthermore, this regional geological evidence demonstrates that the volumes of water that will be injected from the Berry Petroleum Company Newhope lease can never (emphasis added) influence the ground waters to the east due to the sealing faults that prohibit its lateral migration. While we cannot definitely prove that these faults are barriers to ground-water movement, we can demonstrate that these faults are trapping faults with regard to hydrocarbons and certainly prevent the migration of oil. They most likely will confine the injected waters to the Olcese Formation in the immediate area". First of all, the information gives no demonstration that the water will move from west to east. The statement that the ground waters will never be influenced is a very strong statement. They admit that they cannot prove this but state that they can demonstrate the faults are barriers to hydrocarbon migration. If so, where is this proof. If, on the other hand, the faults do confine the injected water then the Olcese Formation will accept a finite amount of water without overpressurizing and may not be a very good disposal zone. This is the problem being faced by Berry Petroleum Company with the Santa Margarita Formation at this time.

ATTACHMENT

The information supplied by the original applicant Berry Ventures and then Berry Petroleum Company the successor to Berry Ventures is insufficient to allow an adequate review for the aquifer exemption request. The following comments briefly state some of the areas of deficiency and in some cases includes suggestions for improvement.

- 1) The boundaries of the aquifer are not clearly delineated on a map. The approximate boundary of the Poso Creek Oil Field is shown but this boundary is somewhat arbitrary and is not a hydrogeologic boundary.
- 2) The boundary of the proposed exempted portion of the aquifer is shown on the Poso Creek Oil Field Index Map. On the map the area is approximately one square mile. In the written portion of the request it is stated that the exemption is being requested for only that portion of the Olcese Formation within section 29, T 27S, R 27E. This confusion over what area is being requested for exemption needs to be clarified.
- 3) The index map on the structural cross-section B-B' indicates some of the lease holders in the area but it does not include a listing of names and mailing addresses. This should be included for public notification if necessary. The list and map should identify all property owners and water rights holders. Include the water district boundaries on the map.
- 4) The map showing the wells in the Poso Creek Oil Field is too difficult to read, a larger map would be more useful. In addition, this map should show well ID, type, depth, and status of at least all wells within the area overlying the portion of the aquifer proposed for exemption.
- 5) The geologic and hydrogeologic description of the Olcese Formation is inadequate. For example, the boundaries (upper, lower, lateral) of the Olcese Formation need to be defined more clearly with cross-sections, maps, and with a narrative discussion. The only cross-section with any detail, cross-section B-B', does not extend down to the Olcese Formation. The hydraulic properties of the Olcese Formation need to be provided along with more discussion and data, if possible, on the ground water flow rate and direction in the Olcese Formation.
- 6) A contour map showing the depth to the top of the Olcese Formation and the faults in the area should be included as a discussion of the areal extent of the Olcese Formation.

- 7) Information needs to be included about the confining zone overlying the Olcese Formation and its adequacy to confine the injected waste waters.
- 8) The reasons for requesting the exemption as given in 40 CFR 146.4 need to be addressed in greater detail.
- 9) An analysis for the produced water needs to be included to determine if the produced water is lower in total dissolved solids than the Olcese Formation water.

SUPPLEMENT TO APPLICATION FOR CLASS II PRIMACY
NON-HYDROCARBON PRODUCING INJECTION ZONES -- DISTRICT 4

1. Field Poso Creek
2. Zone Olcese
3. Depth to top of zone 3215'
4. Thickness 250'
5. Areal Extent entire field, fault-bounded on East
6. TDS of zone 8130ppm TDS (11.5ppm Boron)
7. TDS of Injection Fluid 1200ppm TDS (1.6ppm Boron)
8. Are Injection Fluids other than Produced Water? No
9. Date Injection Began no injection to date
10. Miscellaneous Information The Olcese zone is stratigraphically
below all producing zones within the
field.
11. Drinking Water Aquifer Declaration is not a source
12. Depth Fm: 3215'
WW: 1613'
13. Distance to Towns 4 miles to Bakersfield
14. Land Ownership Agriculture
15. Alternate Water Source --
16. Unusual Geology N-S trending fault acts as permeability barrier to
the east
17. Formation TDS (see #6 above)
18. Yield of Water unknown - never tested

ADDENDUM TO OLCESE ZONE EXEMPTION

POSO CREEK FIELD-KERN CO.

OPERATOR: Berry Ventures

OIL & GAS PRODUCTION HISTORY: The Olcese Zone is not, nor ever has been, productive in Poso Creek Oil field. The Olcese is presently oil productive in a variety of fields in Kern County with Ant Hill, Edison and Mountain View fields being the closest in proximity (see attached map). The zone has also been shown to be oil bearing, but uneconomic, in Mount Poso field (see map). Oil production from the Premier Area of Poso Creek field is from four zones; the Macoma (Etchegoin), the Basal Etchegoin, the Chanac, and the Kelly 2 (Santa Margarita), all of which are stratigraphically shallower, and contain water of better quality, than the proposed injection zone. ~~*/~~In addition to those fields where the Olcese Zone is oil and gas productive, this zone has been exempted in Kern Bluff, Kern River, and Round Mountain fields. The average depth of the Olcese in these three fields is 3000', 3000', and 1000', respectively. Within the Premier Area of Poso Creek, cumulative oil and gas production from all zones from December, 1920 to December, 1984 has been 67,584,000 and 7,740,000 mcf, respectively. Of the nearly 45 million barrels of water produced annually, more than 37 million barrels is reinjected as either steam or waste water. The remaining 8 million barrels is presumably disposed of on the surface probably accounting for the lush green vegetation in valleys and depressions.

BASE OF USEABLE FRESH WATER: 1600'-2000' for area, approximately 1910' for this well.

GENERAL GEOGRAPHIC DESCRIPTION: Low, gently rolling hills and valleys draining primarily southwesterly into Poso Creek. Approximately 8 miles north of the developed city limits of Bakersfield (see map).

CAUSE FOR EXEMPTION APPLICATION: The current disposal zone (Santa Margarita) has insufficient permeability to allow disposal of the large amounts of water produced.

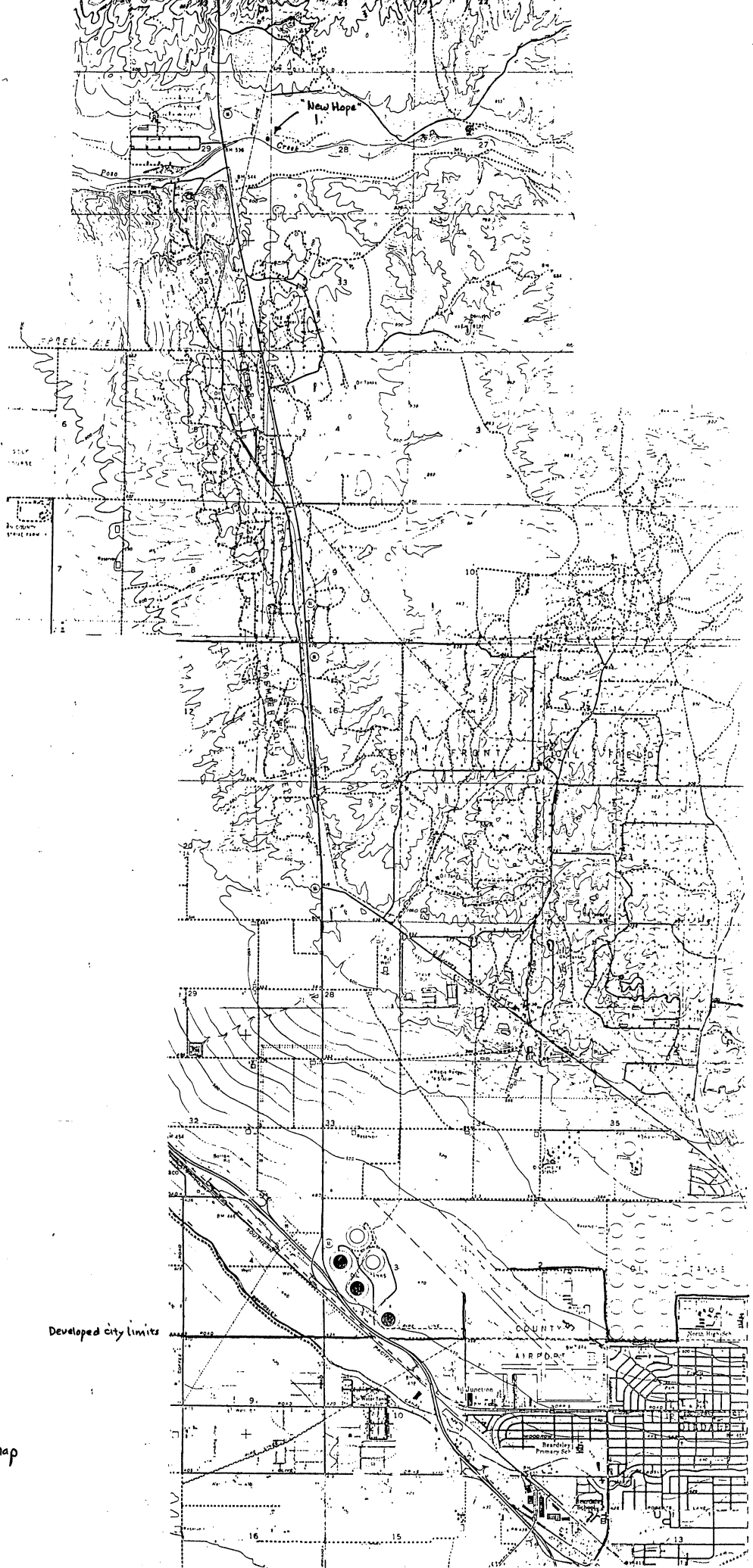
OLCESE ZONE ANALYSIS: See attached

* - This sentence was removed or reworded in Sect. (B. Reid). Most - Olcese in those areas either > 10,000 R/D or RW&CB allows sfc. disp. ∴ the word exempt not applicable.

Specific
Area of
Zone Exemption

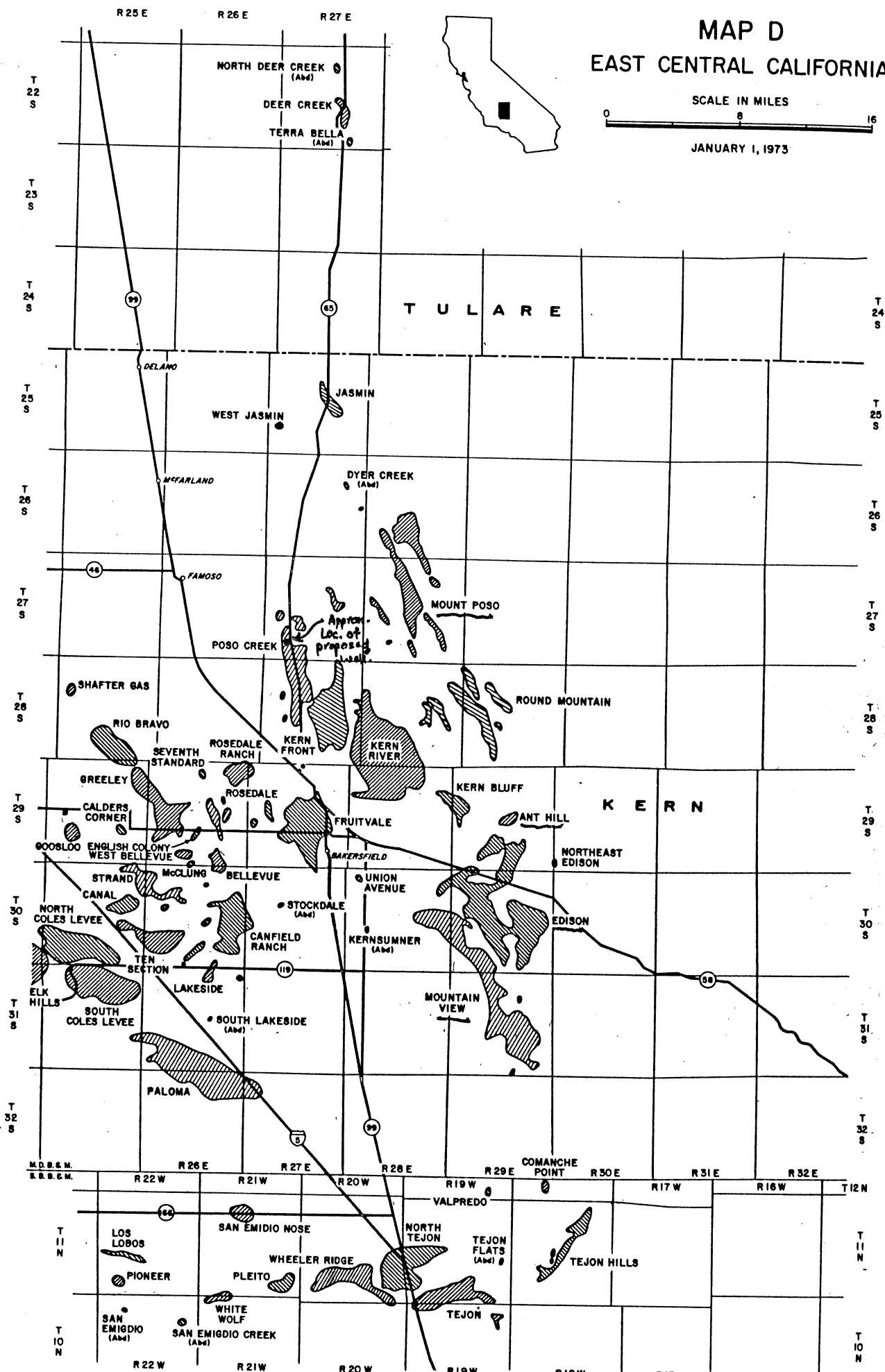
NE 1/4 29
SE 1/4 29
NW 1/4 28
SW 1/4 28

Berry disposing 8308 B/D into New Hope
Santa Marg. Zone. 2,000 - 4,000 R/D
into Topo Oil Federal 8-1 2927/29.



U.S.G.S. Topographic Map

JANUARY 1, 1973



AGRICULTURE
CHEMICAL ANALYSIS
PETROLEUM

BC

LABORATORIES INC.

J. J. EGLIN, REG. CHEM. ENGR.

MAIN OFFICE: 4100 PIERCE ROAD, BAKERSFIELD, CA. 93308 PHONE 327-4911

Berry Ventures
P. O. Box 5182
Bakersfield, California 93388

Date Reported: 7/29/85
Date Received: 7/18/85
Laboratory No.: 11916

WATER ANALYSIS

Sample Description: New Hope #1 Olcese Fm. H₂O

<u>Constituents</u>	<u>mg/liter</u>
Calcium	109.
Magnesium	18.
Sodium	1420.
Potassium	2080.
Carbonate	0.
Bicarbonate	461.
Chloride	3975.
Sulfate	<5.
Nitrate	0.4
Iron	0.47
Manganese	0.35
Copper	0.01
Total Dissolved Solids	8130.
Boron	11.5
Silica	56.
Hardness as CaCO ₃	347. (20.2 gr/gal)
Electrical Conductivity, Micromhos/cm @ 25°C	13100.
Resistivity, Ohm M ² /M	0.76
pH	8.1

B C LABORATORIES, INC.

BY

J. J. Eglin
J. J. Eglin

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JUL 29 1985

DIVISION OF OIL & GAS
LABORATORY



LABORATORIES, INC.

4100 PIERCE ROAD, 93308

BAKERSFIELD, CALIFORNIA 93308

PHONE 327-4911

RECEIVED

JUN 28 1985

erry Ventures
O. Box 5182
Bakersfield, California 93388

Date Reported: 5/1/85
Date Received: 4/19/85
Laboratory No.: 5903

arked: New Hope Lease (Irrigation Water)

Irrigation WATER ANALYSIS

Salinity, $EC \times 10^3$ (Mmhos/cm) @ 25°C

- Below 0.5 Very low salt content, may cause permeability problems.
- Below 0.75 Low salinity hazard - sat. for most crops.
- 0.75 - 1.5 Medium salinity hazard - sat. for moderately salt tolerant crops.
- 1.5 - 3.0 High salinity hazard - sat. for highly salt tolerant crops.
- Over 3.0 Very high salinity hazard - generally unsuitable for continual use except under favorable conditions of soil, climate, tolerance of crop and necessary leaching.

NOTE: This interpretation of EC assumes that 10-20% of the total water applied passes through and below the root zone. In most cases deep percolation losses will satisfy this leaching requirement for the usual crops of the area.

Salinity

EC Mmhos/cm = 1.75

Boron, ppm

- Below 0.5 Satisfactory for all crops.
- 0.5 - 1.0 Satisfactory for most crops; sensitive crops may show injury - leaf injury, but yields may not be affected.
- 1.0 - 2.0 Satisfactory for semi-tolerant crops. Sensitive crops usually reduced in yield and vigor.
- 2.0 - 4.0 Only tolerant crops produce satisfactory yields.

Boron, (B) = 1.7 ppm

Chloride, expressed as epm. Fruit crops in general and many wood ornamentals are chloride sensitive.

- Below 2 Satisfactory for all crops.
 - 2 - 10 Range associated with leaf burn on chloride sensitive crops.
 - Above 10 Generally unsatisfactory for chloride sensitive crops.
- CAUTION: Under high rates of evaporation water with 3 epm chloride has caused leaf burn on sensitive tree crops.

CHLORIDE (Cl) = 11.10 epm.

SAR Sodium Adsorption Ratio. A calculated value used to estimate the exchangeable sodium percentage (ESP) of a soil after long term use of the water.

SAR (Water)	ESP (Soil)	
Below 6	Below 10	No soil permeability problem due to sodium.
6 - 9	10 - 15	Possible permeability problems with fine textured soils (saturation percentage above 50).
Above 9	Above 15	Permeability problems likely on all mineral soils with possible exception of very coarse textured soils (saturation percentage below 20).

NOTE: Permeability problems are more probable at a given SAR with waters of low salinity than at high salinity.

*SAR of Water = 27.54
ESP of Soil = 18.09

pHc** = 7.66

Gypsum Requirement = 16.25 Lbs. 100% Gyp./Hr./100 Gal./min.
(for treating "Residual Sodium Carbonate")

Constituents PPM (parts per million)

Calcium, (Ca)	27.	Nitrate, (NO ₃) (-)	0.4	Carbonates, (CO ₃)	0.
Magnesium, (Mg)	4.8	Nitrate, (N)	0.1	Bicarbonates, (HCO ₃)	332.
Sodium, (Na)	340.			Chlorides, (Cl)	393.
		pH	7.8	Sulphates, (SO ₄)	8.
Total Hardness as CaCO ₃	87.3			Total Dissolved Solids	1,109.
	5.1 gr/gal				

- * Adjusted SAR. (-) refers to "less than".
- ** Values of pHc above 8.4 indicate tendency to dissolve lime from soil through which the water moves; values below 8.4 indicate tendency to precipitate lime from waters applied.

B C LABORATORIES

By

J. J. Egan

AGRICULTURE

CHEMICAL ANALYSIS

PETROLEUM

BC

LABORATORIES, INC.

4100 PIERCE ROAD, 93308

BAKERSFIELD, CALIFORNIA 93308

PHONE 327-4911

Submitted By: Berry Ventures
 P. O. Box 5182
 Bakersfield, California 93388

Date Reported: 5/30/84
 Date Received: 5/16/84
 Laboratory No.: 5566

Marked: New Hope Water Leg (Injection Fluid)

OILFIELD
 WATER ANALYSIS

RECEIVED

JUN 28 1985

DEPT. OF GEOL. & COS.
 BAKERSFIELD

Constituents, Parts/million

Boron (B)	1.6
Calcium (Ca)	31.
Magnesium (Mg)	6.1
Sodium (Na)	355.
Potassium (K)	3.2
Carbonate (CO ₃)	0.
Bicarbonate (HCO ₃)	319.
Chloride (Cl)	424.
Sulfate (SO ₄)	(-) 5.
Nitrate (NO ₃)	0.4
Fluoride (F)	
Iron (Fe)	(-) 0.05
Manganese (Mn)	0.05
Copper (Cu)	(-) 0.01
Zinc (Zn)	
Aluminum (Al)	
Silica (SiO ₂)	48.
Phosphate (PO ₄)	
Total Hardness as CaCO ₃	103 (6.0 gr/gal)
Total Dissolved Solids	1,188.
Oil (Freon extraction)	
pH	8.0
E.C., Micromhos/cm, (Kx10 ⁶) @ 25°C	1,930.
Resistivity, Ohm M ² /M	5.18

(-) refers to "less than"

B C LABORATORIES, INC.

BY

J. J. Eglin
 J. J. Eglin

PROOF OF PUBLICATION

STATE OF CALIFORNIA, }
County of Kern, }

ss.

I am a citizen of the United States and a resident of the County aforesaid; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the assistant principal clerk of the printer of The Bakersfield Californian, a newspaper of general circulation, printed and published daily in the City of Bakersfield, County of Kern, and which newspaper has been adjudged a newspaper of general circulation by the Superior Court of the County of Kern, State of California, under date of February 5, 1952, Case Number 57610; that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

AUG. 8, 9, 10

all in the year 19 85...

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

ELNORA CLARKE

Signature

Dated at Bakersfield, CA 8-13-1985

Elnora Clarke

RECEIVED

AUG 14 1985

DIVISION OF OIL & GAS
BAKERSFIELD

Proof of Publication of

NOTICE

RE: PROPOSED AQUIFER EXAMPTION

PUBLIC NOTICE
FOR PROPOSED
AQUIFER EXEMPTION

In accordance with the criteria of 40 C.F.R. 146.2 of the Federal EPA Underground Injection Control (UIC) Program the Division of Oil and Gas hereby invites comments on the proposal to grant an "aquifer exemption" for the Ocese formation within the Pose Creek Oilfield located at Section 28 T.27S., R.27E. M.D., Kern County.

Oilfield produced brine of about 1300 TDS, and 1.8 ppm Boron are proposed to be injected into the Ocese formation at a depth of 3215' - 3400'. The Ocese formation at the proposed injection interval has a TDS value of about 8130, and Boron of 11.8 ppm.

Any interested person may comment or submit a written request for a hearing to the Division no later than 15 calendar days from the publication of this notice.

Further information can be obtained from the Division office at 4000 Stockdale Highway, Suite 417, Bakersfield, California 93309; (805) 322-6031.

August 8, 9, 10, 1985 (12443)

PROOF OF PUBLICATION

APPLICATION FOR INJECTION ZONE EXEMPTION
NON-HYDROCARBON PRODUCING ZONE - DISTRICT 4

1. Field Kern River
2. Zone Olcese
3. Depth to Top of Zone 2875' (drill depth)/ -2275'±(sub-sea)
4. Thickness 850'
5. Areal Extent entire field, fault-bounded on south
6. TDS of Zone 25,500 ppm
7. TDS of Injection Fluid no fluid ever injected
8. Are Injection Fluids Other Than Produced Water water softener effluent proposed
9. Date Injection Began no fluid ever injected
10. Miscellaneous Information none
11. Drinking Water Aquifer Declaration is NOT a Source
12. Depth Formation: 2875' (drill depth)/ -2275'± (sub-sea)
Water Well: 970' (drill depth) / -370' (sub-sea)
13. Distance to Towns 3 miles east of Bakersfield
14. Land Ownership oilfield property
15. Alternate Water Source the Kern River
16. Unusual Geology major China Zone Fault at southern edge of field, Olcese Zone isolated from shallower and deeper aquifers by 400-800' thick clay/shale sequences
17. Formation TDS (see #6. above)
18. Yield of Water unknown - never tested

Original submitted to Sacramento
8/18/83 dm

Note:

For additional data

see -U.I.C. - Aquifer Exemption (desk file)

APPLICATION FOR INJECTION ZONE EXEMPTION
NON-HYDROCARBON PRODUCING ZONE - DISTRICT 4

1. Field Kern Bluff
2. Zone Olcese
3. Depth to Top of Zone 2354' (drill depth)/- 1575'± (sub-sea)
4. Thickness 1100'
5. Areal Extent entire field, fault-bounded on northeast
6. TDS of Zone 12,500 - 31,000 ppm (from 24 E-log calculations)
7. TDS of Injection Fluid no fluid ever injected
8. Are Injected Fluids Other Than Produced Water both SO₂ scrubber and produced water are proposed
9. Date Injection Began no fluid ever injected
10. Miscellaneous Information none
11. Drinking Water Aquifer Declaration is NOT a source
12. Depth Formation: 2354' (drill depth)/ -1575'± (sub-sea)
Water Well: 405' (drill depth)/ 365' (above sea level)
13. Distance to Towns 5 miles east-northeast of Bakersfield
14. Land Ownership oilfield property
15. Alternate Water Source the Kern River
16. Unusual Geology numerous small faults throughout field, fault-bounded to northeast
17. Formation TDS (see #6. above)
18. Yield of Water unknown - never tested

Original submitted to Sacramento
8/18/83 DM

Note:

For additional data

see A.I.C - Aquifer Exemption (desk file)


SUPPLEMENT TO APPLICATION FOR CLASS II PRIMACY

NON-HYDROCARBON PRODUCING INJECTION ZONES -- DISTRICT 4

1. Field Poso Creek
2. Zone Santa Margarita
3. Depth to top of zone 2635'
4. Thickness 500'
5. Areal Extent entire field, fault-bounded on East
6. TDS of zone 3969 - 4950 ppm TDS (from E-log calculations)
7. TDS of Injection Fluid 925 - 3780 ppm TDS
8. Are Injection Fluids other than Produced Water? No
9. Date Injection Began 6/72
10. Miscellaneous Information Zone is hydrocarbon bearing and has been tested for production, but it is not currently economical.
11. Drinking Water Aquifer Declaration is not a source
12. Depth Fm: 2635'
 WW: 1613'
13. Distance to Towns 4 miles to Bakersfield
14. Land Ownership Agriculture
15. Alternate Water Source --
16. Unusual Geology N-S trending fault acts as permeability barrier to the east
17. Formation TDS (see #6 above)
18. Yield of Water 10 - 12%

note: See U.I.C. - Aquifer Exemption (desk file)

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APPLICATION FOR INJECTION ZONE EXEMPTION
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18. Yield of Water unknown - never tested

Original submitted to Sacramento
8/18/83 DM

8/1/85
Exempt by
definition
MOI - Sect. 170.2
AC

APPLICATION FOR INJECTION ZONE EXEMPTION
NON-HYDROCARBON PRODUCING ZONE - DISTRICT 4

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8/18/83 sm

8/1/85
Exempt by
definition.
MOI - Sect. 170.2
ac

APPLICATION FOR INJECTION ZONE EXEMPTION
NON-HYDROCARBON PRODUCING ZONE - DISTRICT 4

1. Field Mount Poso
2. Area Baker-Grover, West, and southern portion of Main
3. Zone Olcese
4. Depth to Top of Zone 230'-920' (drill depth)/Elevation 0'-600'
5. Thickness 200'-350'
6. Areal Extent continuous throughout areas of injection, Baker-Grover and Main areas probably separated by fault
7. TDS of Zone 900-1100
8. TDS of Injection Fluid 1500-2500
9. Are Injected Fluids Other Than Produced Water No
10. Date Injection Began December 1974
11. Miscellaneous Information surface disposal of produced fluid formerly allowed
12. Drinking Water Aquifer Declaration is NOT a source
13. Distance to Towns 8 miles north-northeast of Oildale
14. Land Ownership West area - Bureau of Land Management, Baker-Grover & Main - private ownership. Land use - rangeland
15. Alternate Water Source possibly shallow water wells
16. Unusual Geology Vedder zone production is separated by faults between areas
17. Yield of Water Unknown

*Note: For additional data
see U.I.C. - Aquifer Exemption (desk file)*

APPLICATION FOR INJECTION ZONE EXEMPTION
NON-HYDROCARBON PRODUCING ZONE - DISTRICT 4

1. Field Mount Poso
2. Area Baker-Grover, West, and southern portion of Main
3. Zone Olcese
4. Depth to Top of Zone 230'-920' (drill depth)/Elevation 0'-600'
5. Thickness 200'-350'
6. Areal Extent continuous throughout areas of injection, Baker-Grover and Main areas probably separated by fault
7. TDS of Zone 900-1100
8. TDS of Injection Fluid 1500-2500
9. Are Injected Fluids Other Than Produced Water No
10. Date Injection Began December 1974
11. Miscellaneous Information surface disposal of produced fluid formerly allowed
12. Drinking Water Aquifer Declaration is NOT a source
13. Distance to Towns 8 miles north-northeast of Oildale
14. Land Ownership West area - Bureau of Land Management, Baker-Grover & Main - private ownership. Land use - rangeland
15. Alternate Water Source possibly shallow water wells
16. Unusual Geology Vedder zone production is separated by faults between areas
17. Yield of Water Unknown

~~Note: For additional data~~
~~See Appendix A for Exemption~~

Memorandum

To : Bob Reid
Sacramento

Date : February 29, 1984

Subject: UIC Injection Zone
Exemption
Mount Poso Field
Olcese Zone

From : Department of Conservation—
Division of Oil and Gas

Place: Bakersfield

The subject zone exemption request, submitted by Macpherson Oil Company, is enclosed. Macpherson has injected produced waste water into the Olcese zone since December 1974 in the West area in well "Ring 20" 3 and since August 1975 in the southern tip of the Main area in well "Tribe A" 10. Offsetting "Tribe A" 10, John L. Sowers has injected since November 1978 in the Baker-Grover area in well "Tribe B" 65WD-28. The waste water, produced from the Vedder zone, generally tests between 1500-2500 ppm total dissolved solids and has the potential for beneficial use. In fact, surface discharge of produced waste water was allowed for several years for use as range water.

The request for zone exemption is based upon two points:

1. Formation water in the Olcese zone is unsuitable for use.
2. The Olcese zone is hydrocarbon bearing.

Based upon these points, we do not feel an exemption should be granted for the following reasons:

1. The Olcese zone water is of relatively good quality, testing 900-1100 ppm total dissolved solids. The water analyses taken from "Tribe A" 6, which is located approximately 1/4 mile directly updip from the injection well, "Tribe A" 10, tested oil and grease, as shown in the enclosure. The UIC, however, makes a clear distinction that water of a quality better than 3000 ppm total dissolved solids must be protected from degradation unless it can be proven that it is so contaminated that it would be economically or technologically impractical to render it fit for human consumption. There is no reference in the UIC to Class 2 or 3 waters.
2. The Division has no evidence, or reason to believe, that the Olcese zone has the potential for commercial hydrocarbon production. The core analysis enclosed is from a well located at least 2-1/2 miles away, and no attempt has been made to produce from the Olcese at this, or any other, location in Mount Poso field.

Hal Bopp

Hal Bopp
Senior Oil and Gas Engineer

HB:mm

Enclosure